Disaster Preparedness Guide

for Incidents involving

Chemical, Biological, Radiological and

Environmental (CBRE) Agents

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Preface

This manual has been developed to assist military emergency and medical planners in preparing for the possibility of an intentional or unintentional CBRE incident occurring at their installations or in their adjacent communities. It is meant to supplement current disaster planning efforts for immediate, local response. The various states and the federal government have elaborate plans and many resources which can be brought to bear to mitigate the effects of disasters, including those caused by CBRE agents. Unfortunately, activation of and response by these various state and federal agencies and their enormous resources takes time (12-18 hours for state resources, 24-48 hours for federal services), and, as is true with most disasters, the most devastating events tend to occur during the initial hours. Disaster response, regardless of the cause, is and will remain primarily a local issue.

Disasters involving CBRE agents are different in several respects from other disasters. First, most disasters are due to natural causes (hurricanes, tornadoes, earthquakes, etc.) whereas CBRE disasters are exclusively man-made, whether intentional or not intentional. Secondly, there is usually little if any warning, especially for intentional CBRE incidents. Thirdly, CBRE incidents may have a high probability of affecting a significant part of the community population.

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Medical Aspects of Disaster Planning

General Concepts

Medical planning for incident response is a 6-step process (See Appendix 1). This process should be followed whether developing initial,
generic plans, or when reviewing and/or modifying existing plans for specific potential disasters, including CBRE incidents. The process
entails:

a. Establishing a planning team;
b. Reviewing existing disaster plans;
c. Estimating medical services requirements:

(1) Risk and vulnerability assessment
(2) Population at risk
(3) Critical modifiers
(4) Realistic parameters

d. Identifying available resources:

(1) Installation resources;
(2) Local/regional resources available for augmentation;
e. Developing the medical annex and CBRE appendices the disaster plan;
f. Testing the plan and identifying deficiencies and taking corrective action:
(1) Programming, planning and budgeting to improvement response posture;
(2) Advising installation commanders and higher echelons;

Planning for disasters due to CBRE incidents is similar to the planning process for any disaster situation. This manual will not discuss disaster planning in general, except to the extent that general planning applies specifically to the CBRE environment. It is important to not attempt to start from scratch - for efficiency of planning, and subsequent operations, it is advisable to build on existing plans, rather than to create a new, separate plan for these situations.

Disaster plans may take a variety of formats. However, per 29 CFR 1910, immediate response to disasters involving hazardous materials must follow the organization structure of the Incident Command System (ICS) first developed by the Fire fighting Resources of Southern California Organized for Potential Emergencies (FIRESCOPE) in the early 1970s after a series of devastating wildland fires. Nearly all Federal Fire Departments, and a vast majority of civilian local and regional disaster response organizations, utilize the ICS system for incident on-scene organization. It is therefore imperative that medical planners become aware of this system.

Federal agencies will be involved in the crisis management of terrorist attacks involving CBRE agents, and most likely will also be required at some point during either the mitigation of or recovery from such incidents. Disaster plans developed along parallel functional capabilities as these plans will provide for improved interface and transition from unassisted local response to state and federally assisted services.

Resources for plan development include: the Federal Response Plan (FRP), the Federal Radiological Emergency Preparedness Plan (FREPP), the Hazardous Materials Emergency Planning Guide, and the Guide for All-Hazard Emergency Operations Planning.

Planning Process

1. Establish a Planning Team

A team approach should be taken in developing a CBRE Incident Annex to the existing disaster plan. This team should provide representation from key offices or functions involved with disaster response. Both internal organizations (facilities management, emergency department) and external organizations which might either support the medical services function, or have significant interface with the medical services should be represented. Just as it is important for all affected organizations to have representation during general ("core") planning, the capabilities and limitations of these other organizations and agencies may have significant impact on ultimate medical services functions and plan design. Potential team membership is included in Appendix (2).

2. Review Existing Disaster Plans and Other Policies and Legislation

Prior to developing a CBRE Response Annex, existing plans should be reviewed. Many of the logistical, supply, mutual assistance, and communications issues will generically apply to all disasters, to one extent or another, and duplication might not be necessary. Military medical treatment facility, installation, and community plans should all be perused. All existing Memoranda of Understanding/Agreement and Interservice Support Agreements should be reviewed. For large disasters, many regions have assigned one medical treatment facility to serve as the overall coordinating body for all hospitals. Other potential treatment locations (doctor's offices, urgent care centers) have frequently been identified, and procedures may already be in place to activate these centers. If this is the case, this must be factored into disaster planning.

Existing service and Defense Department instructions and directives, as well as applicable state or federal statutes and rules and regulations, should be reviewed. Many of these are included in the reference section of this manual (Appendix (9).

3. Estimating Medical Services Requirements

Medical Services requirements include both immediate response and extended/mass care needs. Initial estimates are developed based on determination of the population at risk, an identification of actual risks, and application of critical modifiers that might increase or reduce medical requirements:

Risk evaluations estimate both potential threats and vulnerabilities. Where possible, actions are taken to reduce of eliminate these. Threats and vulnerabilities should include those in the proximate local community that might adversely impact installation operations or that would affect the ability of local agencies to assist with installation disaster mitigation. Additional threats might exist due to heightened terrorist activities or movements, which is the responsibility of intelligence communities to track and report. Vulnerabilities might include unprotected waterfronts, high visibility targets (national shrines),or an open-gate policy at the installation. Appendix (3) includes a general approach to hazardous materials analysis.

Population at risk would include not only active duty service members assigned to the installation, but would include those resident dependents, civil servants, contractors, and guests at the installation at the time of the incident. Since installation populations may vary by more than 400% throughout the day, potential medical system demands might be extreme.

Critical modifiers increase or decrease medial service requirements. Certain assets, including assigned personnel, are designated as Critical/Key Assets, which are considered vital to national security and might require additional services. The availability and proximity of state and federal level resources will affect the time that installation resources must function with only local assistance, and in certain locations, these local resources may not exist. Finally, guidance from higher authority may be provided to increase or decrease readiness posture.

Once needs assessments have been made, realistic parameters must be set. In most locations, regional and state assistance should be available within 12 hours, and federal assistance through the Stafford Act should be on-scene within 24 hours. However, the potential exists for a worst case scenario, especially if biological weapons are used: A man portable 8-liter aerosol sprayer could release a biological agent in less than 5 minutes, and could contaminate a 2200 km2 area. Metropolitan emergency managers plan for between 10,000 and 10% of the population affected by biological agents, and up to 1,000 for chemical, environmental, and non-thermonuclear radiological agents. However, for certain aspects of planning, 100% of the population could be affected. Examples would include both post-exposure prophylaxis, which must be started within 24 hours of exposure, shelters, and Critical Incident Stress

Debriefing (CISD) mental health services. A variety of medical planning guides exist for estimating casualty numbers.

Finally, an estimate is made of the various medical resources (personnel, equipment and supplies, facilities, and transportation services) which would be required to provide immediate response and mitigation during the initial phase of the CBRE disaster.

4. Identifying Available Medical Resources

Required resources must be matched with those available. Since it is unlikely that installation resources will be sufficient to manage CBRE incidents, this would include those resources available locally and regionally to augment installation medical services. Consider resources from a functional aspect. In addition to prehospital and acute care services, provisions for mass care for extended periods must be made.

Prehospital care services require personnel, equipment, supplies, and vehicles. Personnel must be trained and experienced in triage, treatment, and transportation functions. They must also be trained in hazardous materials to the OSHA Operations level, and in the pre-hospital treatment of specific medical consequences of exposure to CBRE agents. Personnel must be identified to provide sustained operations for extended periods of time. By doctrine, decontamination is not a medical services function; however, history has shown that decontaminated patients do access pre hospital care services – EMS personnel must be trained in field decontamination procedures. Additional equipment would include such items as OSHA-approved Individual Protective Equipment, Nerve Agent Antidote Kits, and contamination detection supplies (M8/9 paper). Vehicles available for transport of ambulatory victims, such as buses and trucks, should be identified as well.

Ideally, all critical patients should be transported to the nearest appropriate medical treatment facility. In a disaster situation, this is not always possible. Approximately half of all disaster victims will arrive at a treatment facility (which might not be a hospital) by methods other than traditional prehospital care (EMS) services. Between 15-40% of potential victims will arrive at the nearest recognized medical facility, and will do so within the first hour of the disaster. The installation medical treatment facility might be within the contaminated area, requiring redeployment of facility personnel to other locations, possibly off installation, to provide medical services. In addition to identification of hospital capacity (bed capacity, average daily occupancy, specialized capabilities – ICU, isolation, and ventilator beds, and emergency department/urgent care capacity, knowledge of caches of critical stores, such as antibiotics and antidotes, is a requirement. Decontamination capabilities (primarily for large numbers of ambulatory personnel) must be identified. Again, sufficient personnel trained and experienced in decontamination, triage, treatment and personal protection must be identified to provide sustained operations.

Mass and extended care require special attention. Have facilities been designated as mass shelters, and are there sufficient shelters outside potentially affected areas? Not all individuals at these sites will be healthy and might need medical care prior to restoration of normal society locally. Approximately 80% of individuals affected by disasters seek shelter with family or friends. However, it might be necessary to quarantine all personnel within a given distance of the attack until the biological agent is identified. With mass gatherings under rather austere conditions, diseases which are considered relatively innocuous or rare can have devastating effects - in third world countries, for example, measles is a leading cause of death from infectious diseases. Potable water, sanitation, vector control, and animal control might become necessary, depending on the circumstances and length of time for restoration.

5. Develop Medical Services and Mass Care Annexes and CBRE Appendices

It is presumed that a working disaster preparedness plan is in existence. National consensus panels reviewing CBRE response initiatives have almost uniformly recommended that all measures taken in response to CBRE incidents be incorporated into existing structures and response plans as the most efficient and cost-effective means of dealing with this threat.

When developing these annexes and appendices, it is important to consider all aspects of disaster preparedness: Routine operations, pre-incident planning considerations, immediate post-incident response operations, and longer term recovery operations.

Routine operations would include those actions, which are performed as a medical defense against CBRE events. Such items would include environmental surveillance operations. Additionally, because covert biological attacks must be detected as early as possible in order for post-exposure prophylaxis to be effective, it might be necessary to establish a health monitoring program which provides daily reports on symptom based medical problems

(e.g. diarrheal disease, upper respiratory track infection symptoms). Also included in routine operations would be those training requirements of personnel who would be involved in the various phases of disaster mitigation – EMS person, hospital providers, and environmental health officers, to name a few.

Pre-incident planning would include those actions that should be undertaken in the event of prior notification of a terrorist attack or CBRE incident. For terrorist attacks, this might be best accomplished by coupling those actions with the installation threat condition.

Post-incident planning encompasses all actions to be taken in immediate response (first 24-48 hours) after an incident. Many of these items will have already been accomplished given prior notification.

Special attention should be taken concerning the stages of operations directed against biological incidents, since these are most apt to be detected and initially responded to outside the usual emergency (9-1-1) system. A proposed template for operations may be found in the appendices.

Although federal assistance should be available within 24 hours, in the case of mitigation, the federal agencies (as coordinated through the Federal Emergency Management Agency) are there to primarily assist local and state agencies; therefore, continued active participation by local emergency management personnel will still be required. Medical aspects of mass care and infrastructure restoration (both physical and functional) are accomplished during this phase. Prior to complete functional restoration, abnormal operations will continue to be in place.

Many planning tools are available through the Federal Emergency Management Agency and other organizations involved with disaster preparedness, and some of these are available through the Internet.

6. Testing Plans, Identifying Deficiencies and Taking Corrective Action

As with all disaster plans, the need to validate material resources, human resources and training, and policies, procedures and protocols requires that the plan be tested and revised periodically. There are two primary methods of testing these plans, which are educational processes in themselves: tabletop exercises involving key members from all functional organizations, and full-scale field exercises.

By testing CBRE incident disaster plans in a variety of plausible scenarios, deficiencies in those plans may be readily apparent. Once a deficiency is identified, there are several options:

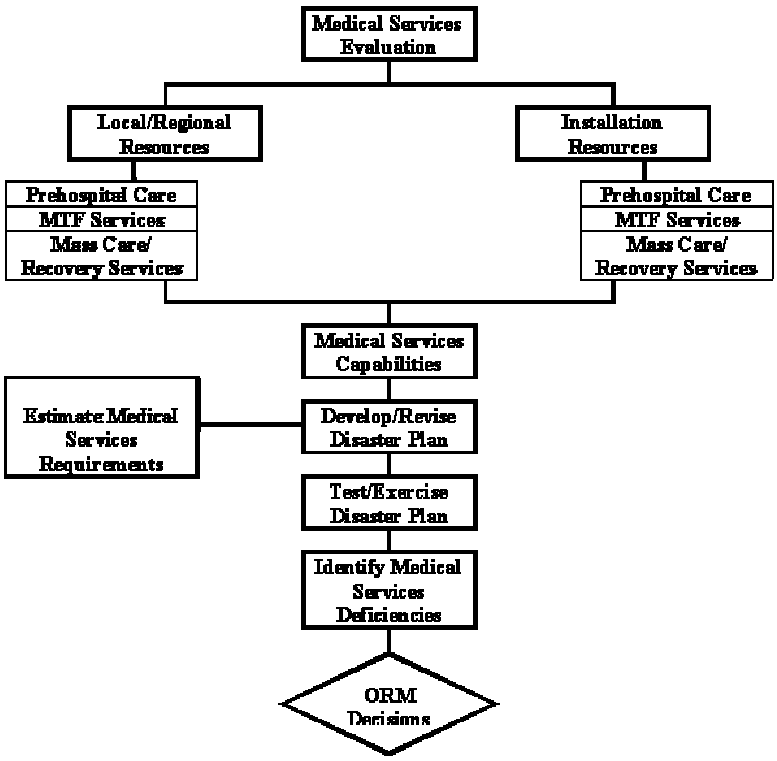
a. Modifications in policies, procedures, protocols or the disaster plan might eliminate or alleviate the deficiencies.

b. Additional resources may be obtained through programming, planning and budgeting.

c. Installation commanders or higher authority may take steps to reduce vulnerabilities or threats, thereby reducing medical services requirements and eliminating the deficiency.

d. The deficiency might be considered an acceptable risk.

CBRE Medical Services
Disaster Planning Process



Potential Disaster Planning Team Members

Security

Fire and Emergency Services

Public Works

Social Services Agencies

American Red Cross

Public Affairs Officials

Mortuary Affairs

Facilities Management

Installation Operations

Installation Safety

Installation Media Services

Legal Services

Veterinary Services

Community Emergency Medical Services Organizations

Community Hospitals

Community Disaster and Emergency Response Organizations

Regional and State Offices, as appropriate

Threats and Vulnerabilities

Potential Threats

1. Hazardous Materials Identification
   a. Types and quantities of hazardous materials located in or transported through a community.
   b. Locations of hazardous materials facilities and routes
   c. Nature of the effects most likely to ensue as the result of a release of these substances

2. Specific sites with a high probability of hazardous materials

   a. Chemical plants
   b. Biological research centers
   c. Refineries
   d. Major industrial facilities
   e. Petroleum or natural gas farms or depots
   f. Storage facilities
   g. Trucking terminals
   h. Railroad Yards
   i. Hospitals and educational institutions
   j. Waste disposal and treatment plants
   k. Port authorities
   l. Airports
   m. Nuclear reactors and nuclear processing plants
   n. Major transportation corridors

3. Intelligence community information

    a. Location of domestic or international terrorist cells
    b. Other extreme cultural or religious sects
    c. Current intelligence on most probable chemical or biological warfare agents

Potential Vulnerabilities

1. Public Access

    a. Open gate policy
    b. Shared military/civilian facilities or properties
    c. Unguarded or unmonitored perimeter fencing
    d. Unprotected waterfronts
    e. Dual use airfields
    f. Uncontrolled airspace
    g. Major thoroughfares or railways which pass through installations

2. Proximate civilian targets

    a. Government buildings
    b. Educational institutions
    c. Stadiums or arenas
    d. Nuclear power plants
    e. Chemical production plants
    f. Chemical storage facilities
    g. Abortion clinics
    h. National shrines
    i. Animal research centers

Critical Modifiers

1. Isolated locations
    a. Island installations
    b. Rural or wilderness areas
    c. Overseas locations
2. Special sites
    a. Critical Asset Assurance Program sites
    b. Key Asset Assurance program sites
    c. Major logistics or supply centers
    d. Major shipyards
    e. Low frequency communications facilities
    f. Other major C4I locations
    g. Central commands/type commands

3. Locations designated by higher authority as requiring additional mitigation efforts

Medical Services Capabilities

Function	Installation	Local/Regional Resources
Prehospital Care		
Transport Vehicles Air Fixed Wing Rotorcraft Ground Ambulances Patient Transport Vans Patient Buses Other		
Personnel EMTs EMT-Basic EMT-Intermediate Paramedics Specialty Response Teams		
Equipment & Supplies Individual Protective Equipment Decontamination Equipment Contaminant Detection Equipment Personal Antidotes Personal Prophylaxis		
Medical Treatment Facilities		
Receiving Areas Contaminated ambulance areas Helicopter landing zones Mass decontamination areas Holding Areas Medevac staging areas Mortuary services Ambulatory patient areas Bed Capacity Emergency Department In-patient Beds Isolation Units Intensive Care Units Supplies & Equipment Antidotes Post-exposure prophylaxis Individual Protection Equipment Decontamination supplies Contaminant detection equipment		
Mass Care Capabilities		
Shelters Arenas Gymnasiums Campgrounds Auditoriums		
Special Needs Locations for Nursing Home patients, children, ill or injured not qualifying for hospitalization		

Specialized Medical Services American Red Cross Social Services Environmental health Officers Public Health Officers Veterinary Services Personnel Food Services Officials Sanitation Specialists		
Mass Care Medical Facilities		
Prophylaxis Distribution Centers		

Medical Services Function Annex
(SAMPLE)

I. Purpose: {This section describes in general terms the purpose of the annex, e.g., to provide emergency medical services (EMS), treatment facility, public and environmental health services, mental health services and mortuary services in the event of a declared disaster situation. It also describes the activities related to those services.}

II. Situation and Assumptions: {This section outlines general assessment and overview of existing capabilities. It further describes limitation that might degrade health care operations. Specific situations and assumptions involving CBRE incidents which should be considered include:}

CBRE incidents would be primarily large-scale events that would rapidly overwhelm local medical resources
Local health care resources might be degraded due to location in a contaminated areas
Exclusively existing local resources will most likely provide health care services during the first 12-24 hours (longer overseas)
Medical care resources might be forced to relocate operations under austere conditions in temporary structures
Volunteers are less likely to come foreword in situations with unknown CBRE agents than in most disasters

III. Concept of Operations: This section describes how operations will be conducted. It further describes interaction with other jurisdictions and State or Federal agencies.

A. General: Areas to be described include:

Routine operations directed against CBRE incidents:
Environmental surveys
Health surveillance
Training and exercises involving:
- EMS personnel
- Hospital providers and ancillary staff
- Hospital emergency operations personnel
- Specialized personnel or medical teams

Equipment and supply inventory, preventive maintenance
Antidote and post-exposure prophylaxis cache maintenance and exchange
Actions to be taken in the event of heightened threat conditions
Actions to be taken in the event of a suspected or actual incident
Methods of determination that an event has occurred
Conditions and provisions for mobilization of medical care services
Separate algorithms for dealing with potential threats, actual threats, unannounced releases, or probable hoaxes should be addressed
Medical services command post(s)
Overall structure and coordination of medical services
Treatment considerations
Triage
Decontamination procedures, especially for large populations
Methods of identification of hazardous materials
Specific actions to be taken for long term recovery operations in the event of a CBRE incident

B. Relationships with other Jurisdictions
Mutual aid agreements
Other arrangements with other agencies, such as USAMRICD, CDC, etc

IV. Organization and Assignment of Responsibilities

A. Command Suite
B. Medical Control Officer
C. Emergency Medical Services {Specific discussion of:

Response to a scene
Command and control at the scene
Treatment of victims in contaminated areas
Triage
Command and control of assisting agencies
Evacuation and contaminated vehicles.}

D. Medical Treatment Facilities {CBRE issues to be discussed include;

Conditions and procedures for activation of hospital disaster plan
Mass decontamination - 40-50% of CBRE victims arrive at MTFs through other methods than EMS
Communications nets
Isolation of infected patients
Handling of large number of cadavers, some of whom are still contaminated or are infectious
Handling of large quantities of contaminated clothing.}

E. Public Health Services

Public health and epidemiological services are vitally important in both early detection of biological
Agent release, and in following the course of the attack
Coordination with specialty laboratories for identification of agents
Coordination of immunizations or prophylaxis and distribution centers
Monitoring of food handling and mass feeding and sanitation

F. Environmental Health Services {Coordination for such services as:

Vector control
Potable water availability
Structural inspections for habitability}

G. Mental Health Services {In the event of a CBRE incident, with or without large numbers of casualties, a large percentage of the population will require early and extended mental health services. services will also be needed for hospital personnel and emergency responders.}

H. Mortuary Services {Anticipate very large numbers of fatalities, who might be contaminated or infectious. Temporary morgues might be needed.}

I. American Red Cross {Additional ARC volunteers will most likely be needed for assistance in all social services functions.}

J. Social Services

K. Animal Control

L. Security {Up to 45% of victims, or those who feel they have been exposed to these agents, will go to the nearest medical treatment facilities, including urgent care centers or individual physicians' offices, and will arrive within hours of the exposure. Crowd control is therefore advisable.}

V. Administration and Logistics

A. Administration {This section outlines administrative procedures to be followed.}
B. Logistics

VI. Plan Development and Maintenance

VII. Authority and References

CBRE Appendix to Disaster Plan

(SAMPLE/GENERIC)

I. Hazard Defined

II. Risk Areas {Identify high risk areas, as outlined under vulnerability assessment. For industrial chemicals, radiological stores, identify specific storage areas.}

III. Estimates of Vulnerability Zones

For industrial hazardous materials, estimate the approximate area affected from an airborne release, which is worst case scenario.
Identify also most probable release scenarios.
For terrorist activities, a reasonable initial zone would be 2000 meters in all directions (unknown wind condition) since EOD sets initial contaminated zones as 2000 meters downwind and 450 meters in all other directions

IV. Determine Vulnerability

Identify populations within vulnerability zones
Identify other significant structures in those zones (e.g. barracks, hospitals, etc.)

V. Risk Assessment

Estimate risk using Operational Risk Management guidelines

VI. Direction and Control

29 CFR 1910 requires that an Incident Command System be used for on-scene management of response activities involving industrial hazardous materials.

a. Response Actions

Notification procedures for local response organizations
Determination that release has occurred
Estimation and accurate determination of areas and populations affected
Identification and designation of special technical experts (e.g. chemists, toxicologists, etc.) to augment response organizations
Identification and response of special teams
Methods of identifying specific hazards

b. On-scene Response Actions

EMS personnel have appropriate individual protective equipment, including antidotes and personal prophylaxis
EMS personnel and equipment are staged upwind and outside hot zone of area
EMS personnel set up a contaminated treatment area, holding areas (deceased/alive)
Identification of contaminated patients, equipment and supplies
Disposal areas for contaminated clothing, etc

VII. Public Information

Determination of appropriate release of public health information
Provision of personal protective instructions through the media
Diversion of scheduled patients from medical treatment facilities

VIII. Evacuation Procedures

IX. Mass Care

Upwind, out of range facilities
Provisions for prophylaxis distribution points
Provisions for mass care medical services, including for special needs patients

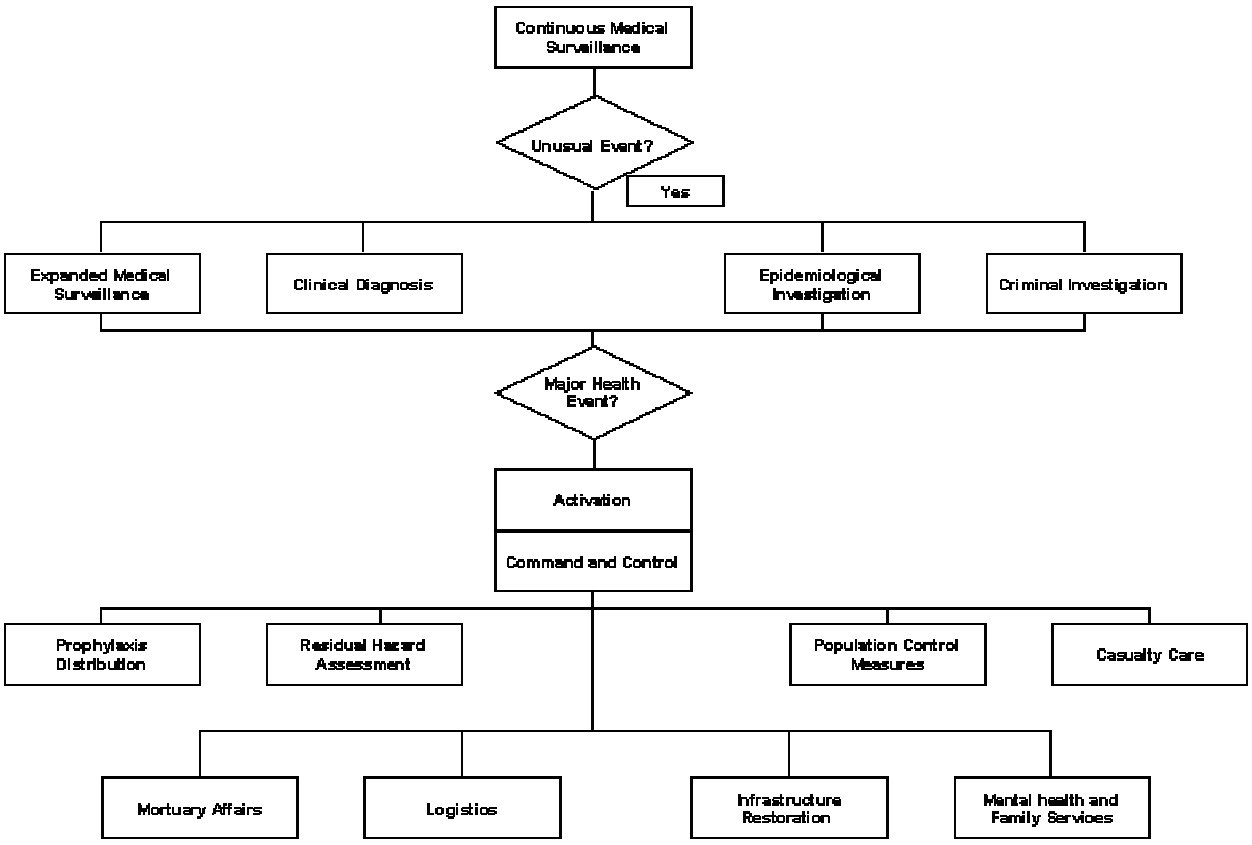
X. Medical Services

Designation of medical treatment facilities with capabilities for treatment
Designation of medical treatment facilities with capabilities for decontamination
Monitoring air, soil and water for hazardous materials
Provisions for continued medical surveillance

XI. Resource Management

Antidote, prophylaxis, antibiotic stockpiles
Replacement protective equipment for medical decontamination and EMS personnel
Provisions for medical hazardous material detection or sampling devices and handling thereof
Points of contact and procedures for obtaining stockpiles

Biological Response Template and Key Decisions



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